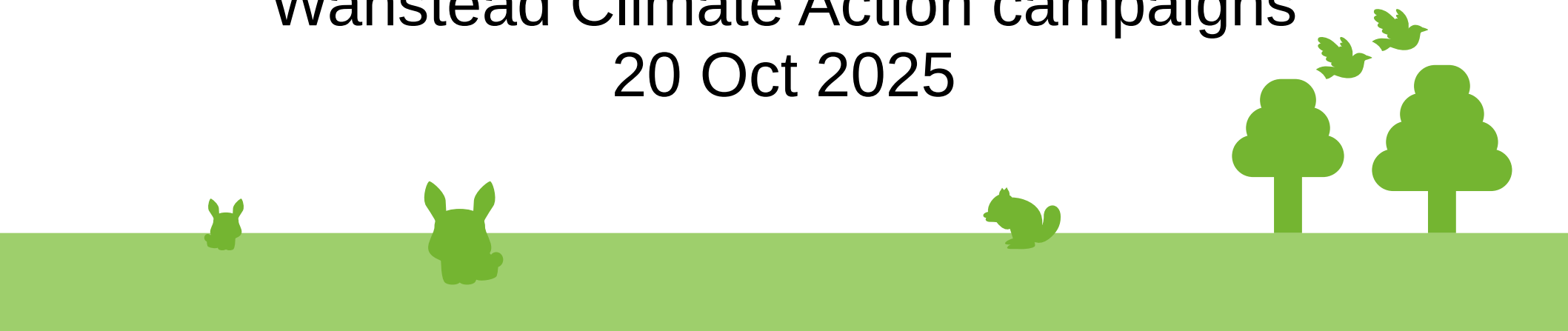
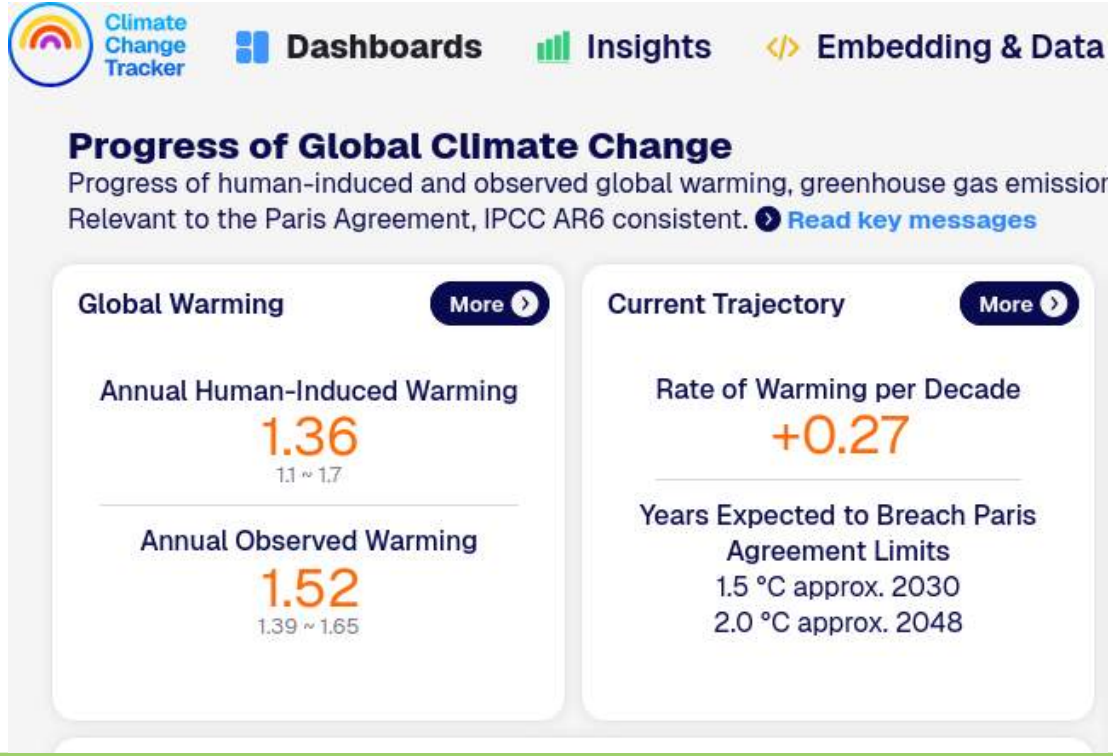
Everything You Always Wanted to Know about the Climate Crisis but Were Too Terrified to Ask

Knowledge sharing for
Wanstead Climate Action campaigns
20 Oct 2025

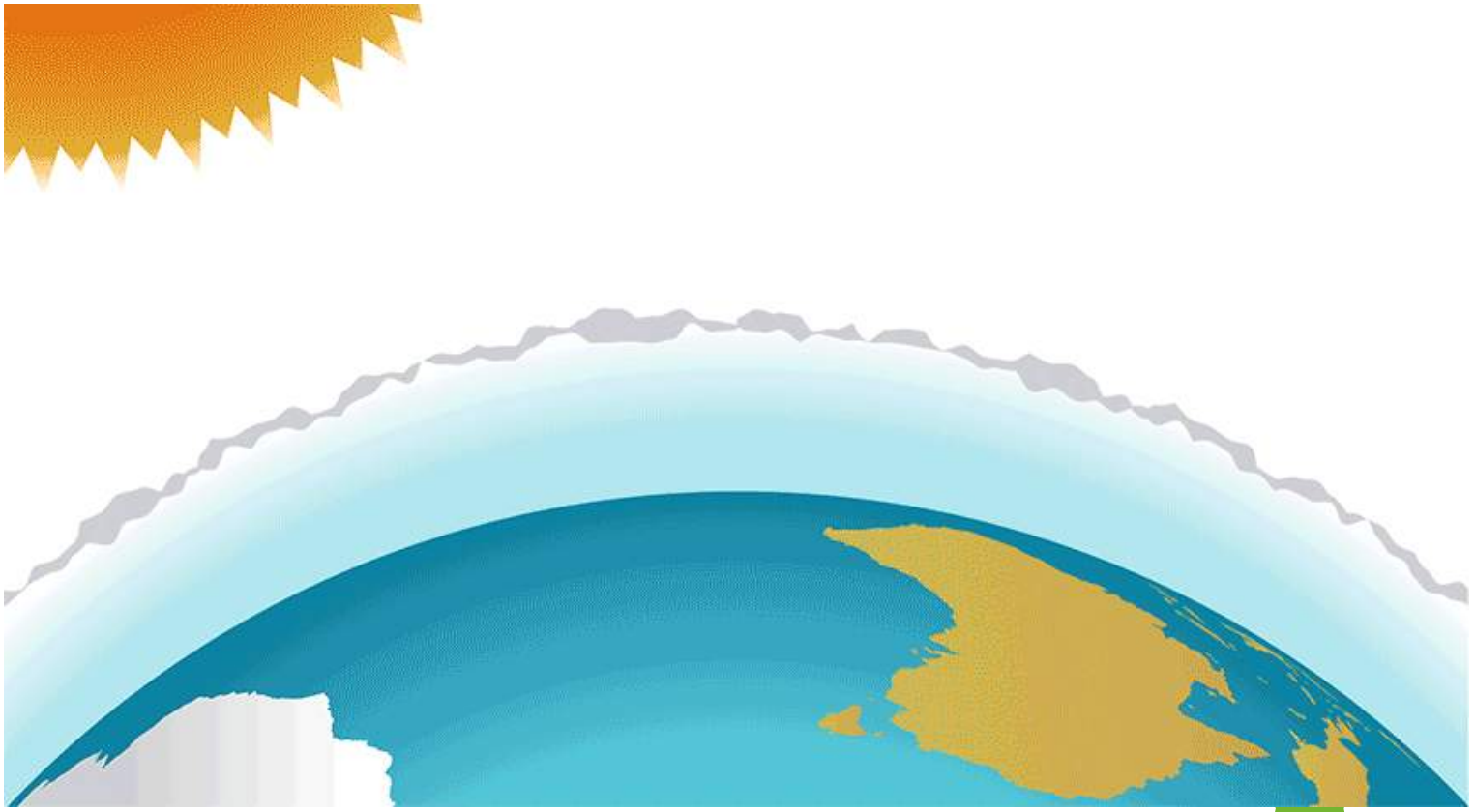


How hot has it got? Are we at 1.5 °C yet?

- Lots of graphs to come. https://climatechangetracker.org/



Why is it warming?



Greenhouse effect animation – the ‘thicker blanket’ analogy
https://www.dcceew.gov.au/climate-change/policy/climate-science/understanding-climate-change

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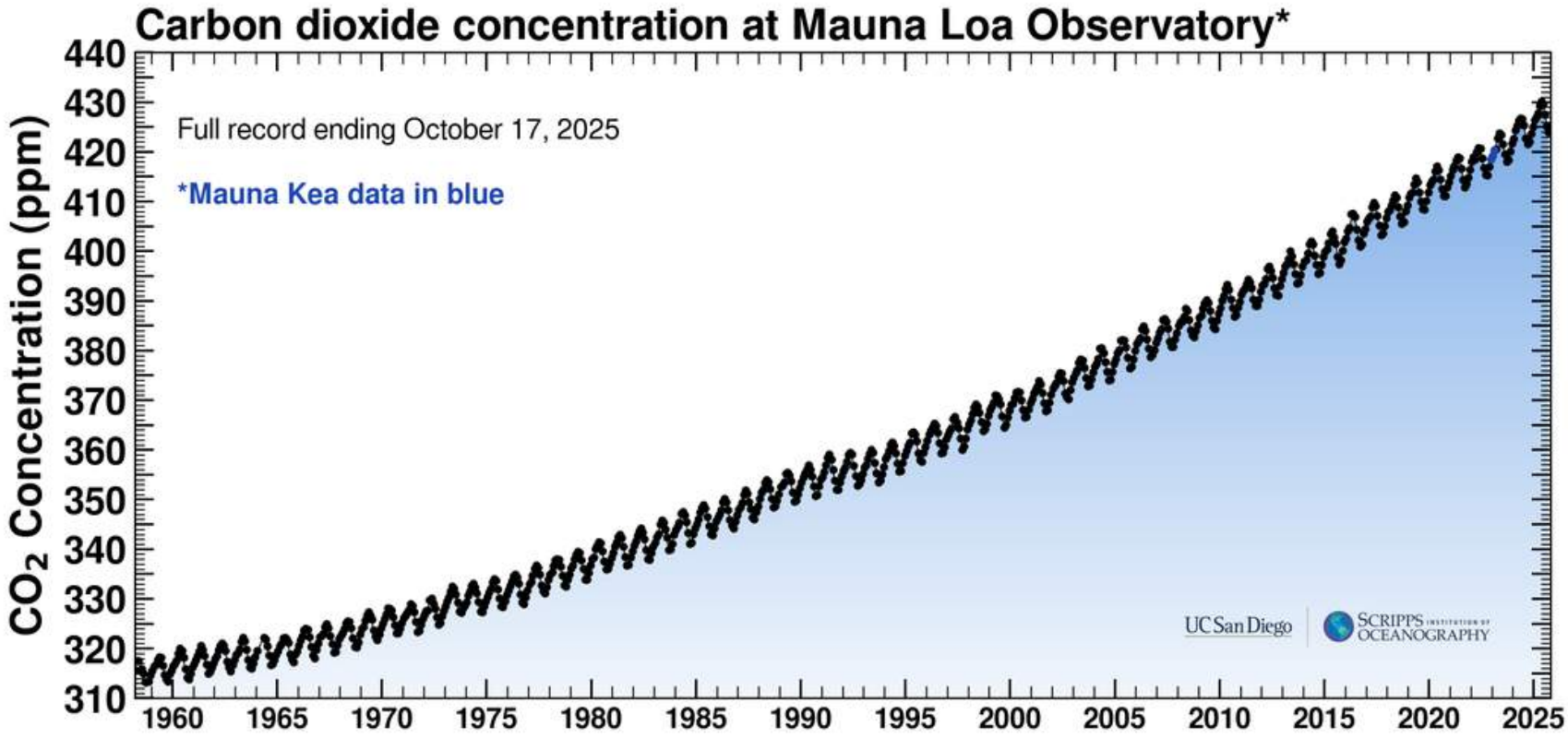
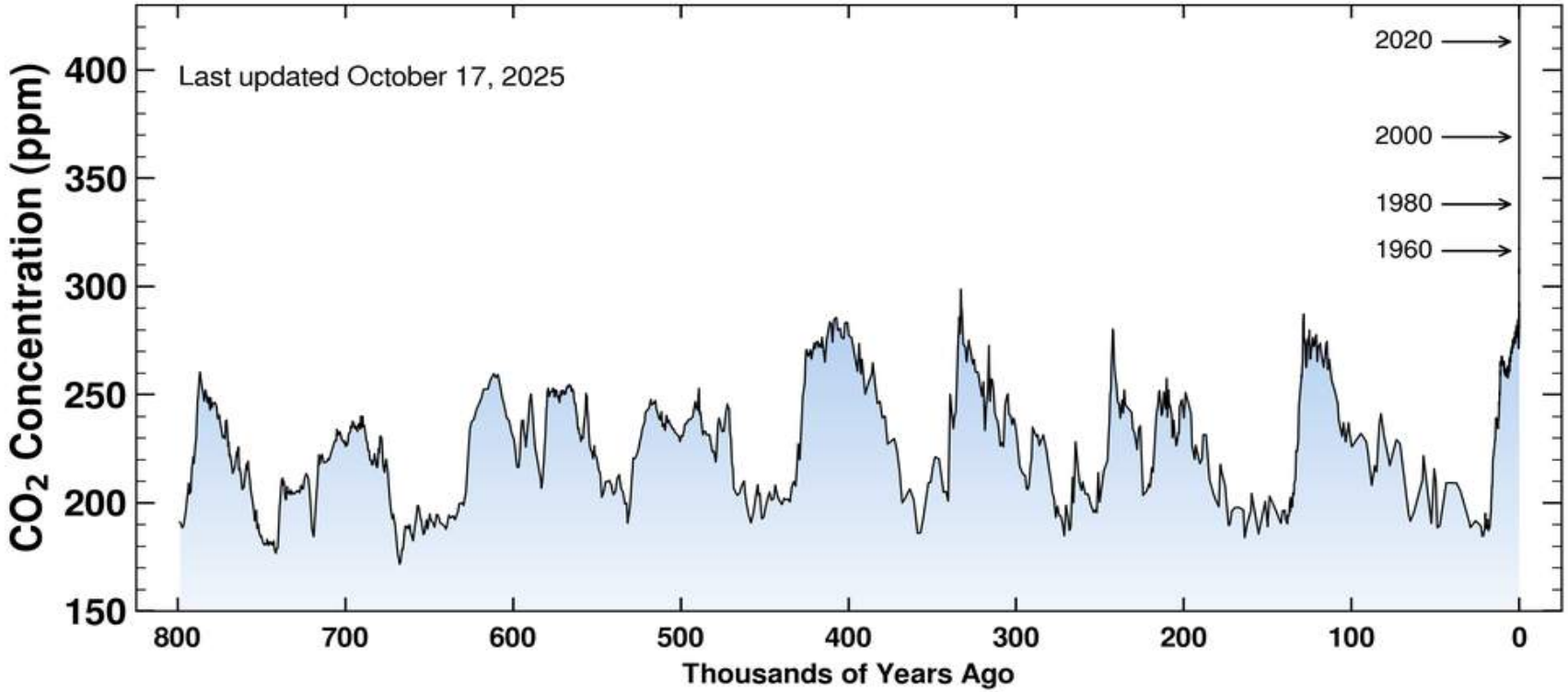


Why is it warming?

keelingcurve.ucsd.edu



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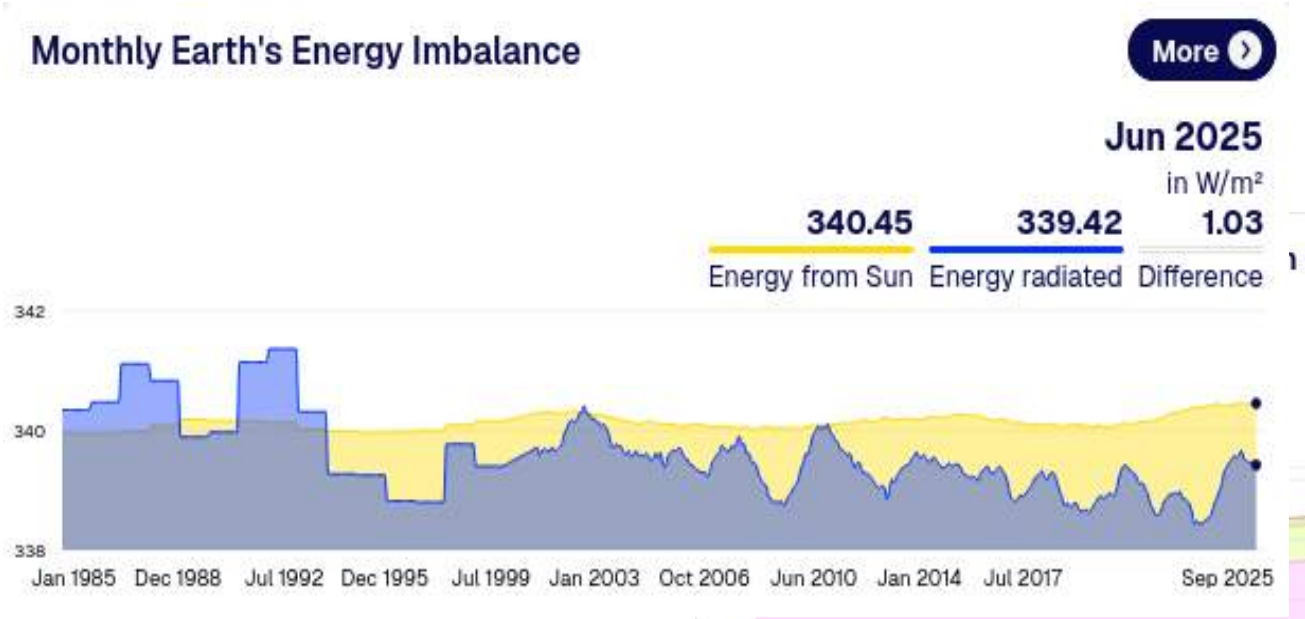
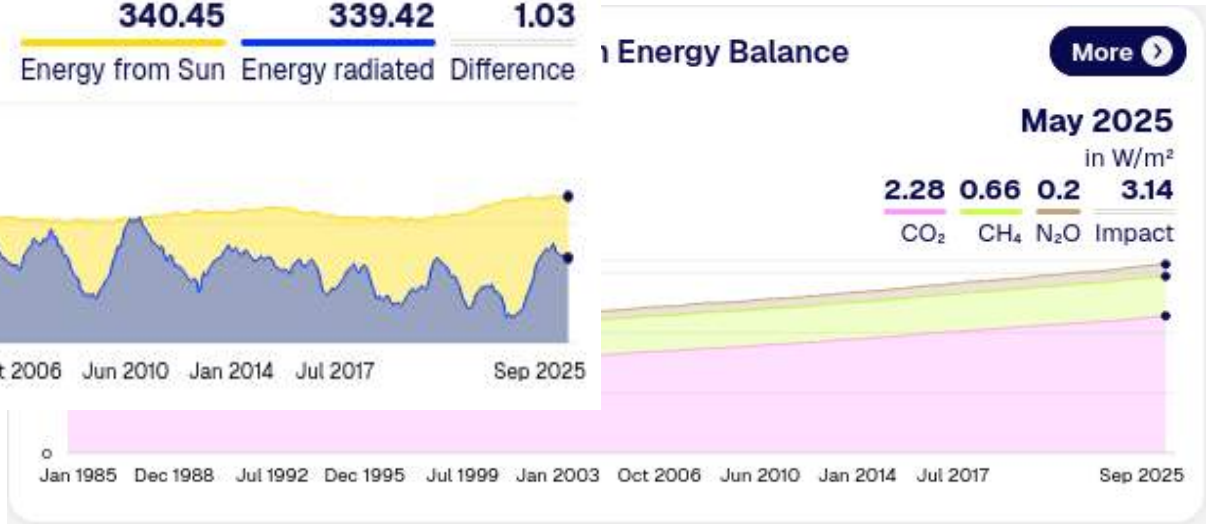


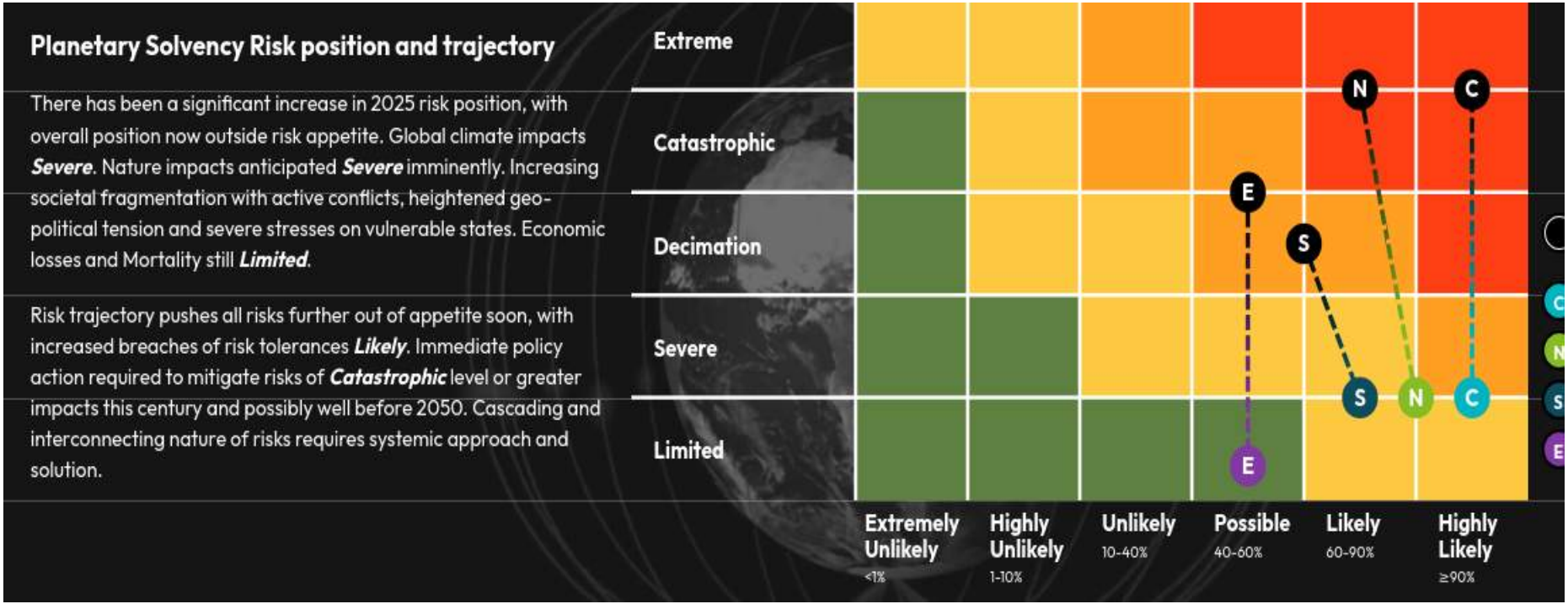


Why is it warming?

Questions?

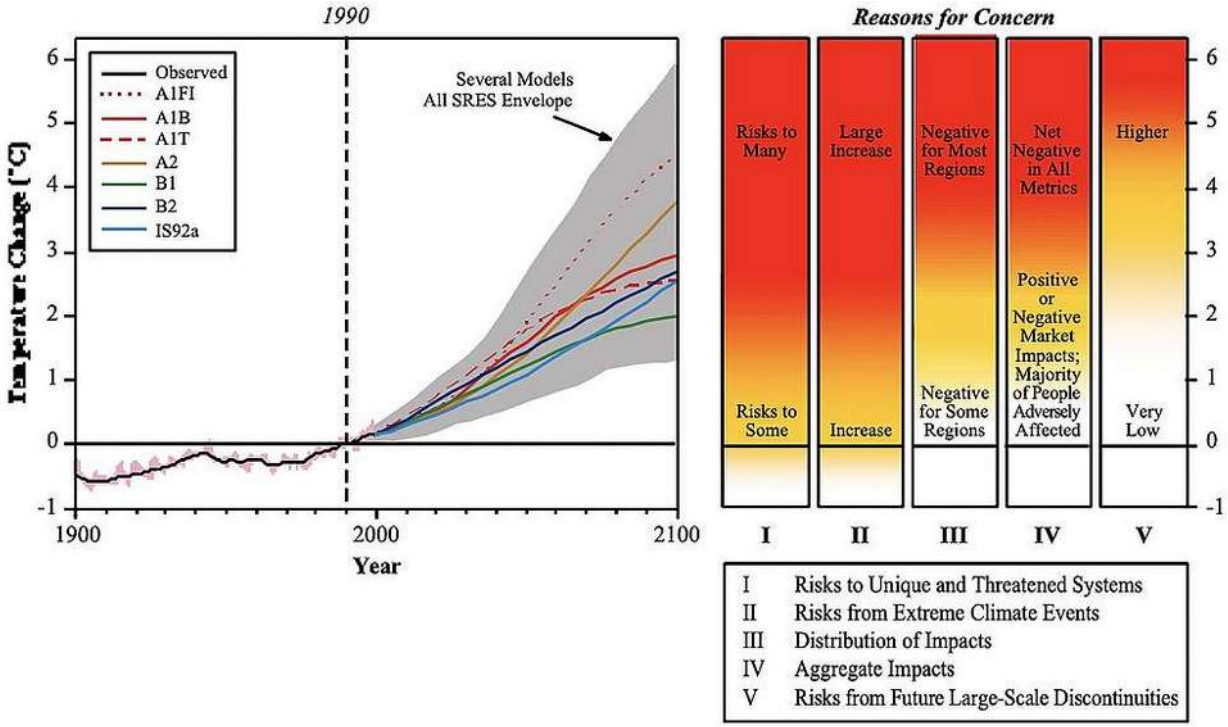
Next sections:
what are the risks?
how fast do we need to cut emissions?

What are the risks?



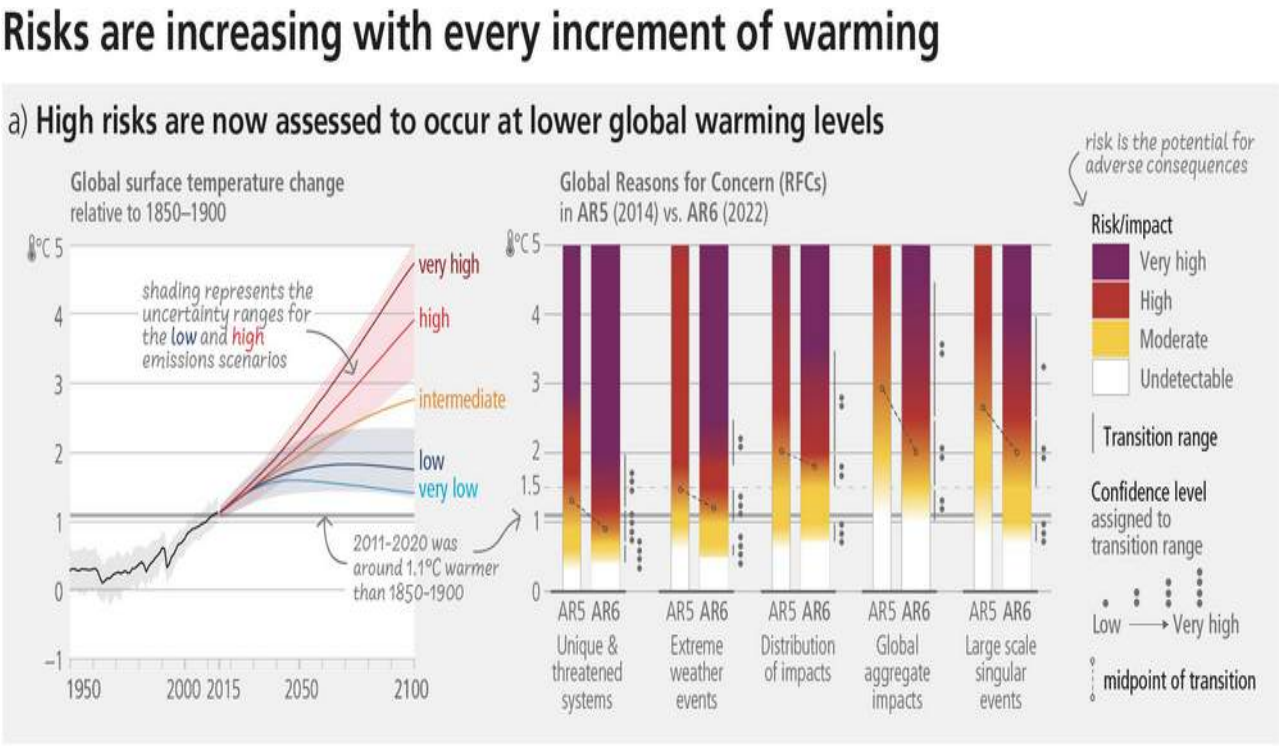
- https://global-tipping-points.org/planetary-solvency/

What are the risks?



IPCC Third Assessment Report (2001)
”Burning Embers” / “reasons for concern”

What are the risks?



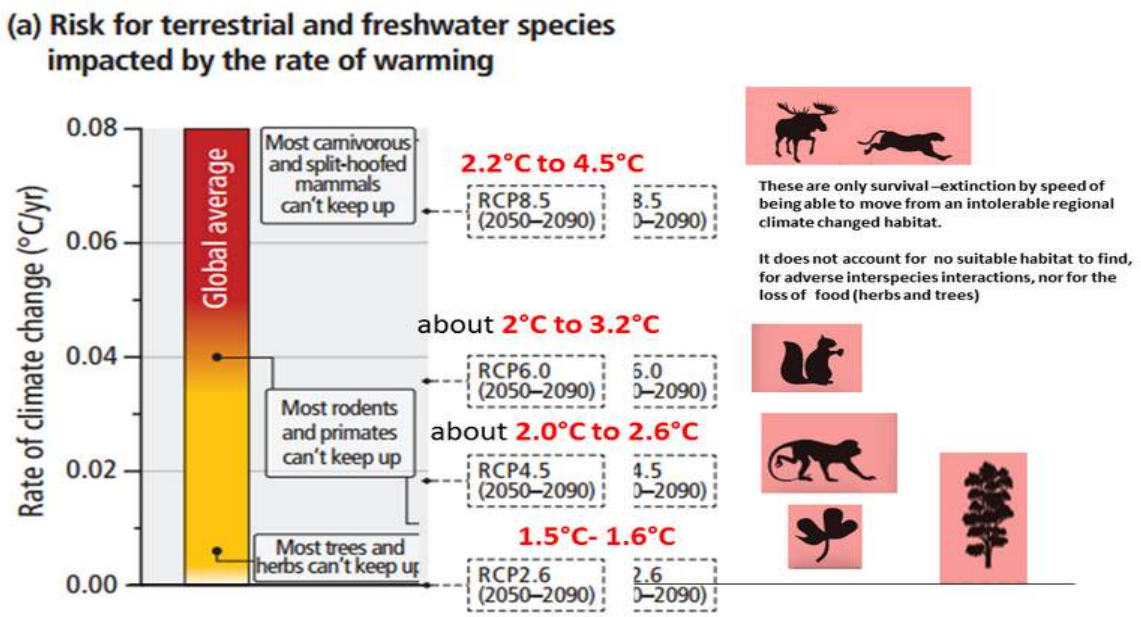
IPCC Sixth Assessment Report (AR6, 2023)
”Burning Embers” / “reasons for concern”

(increasing *understanding* of risks)

What are the risks?

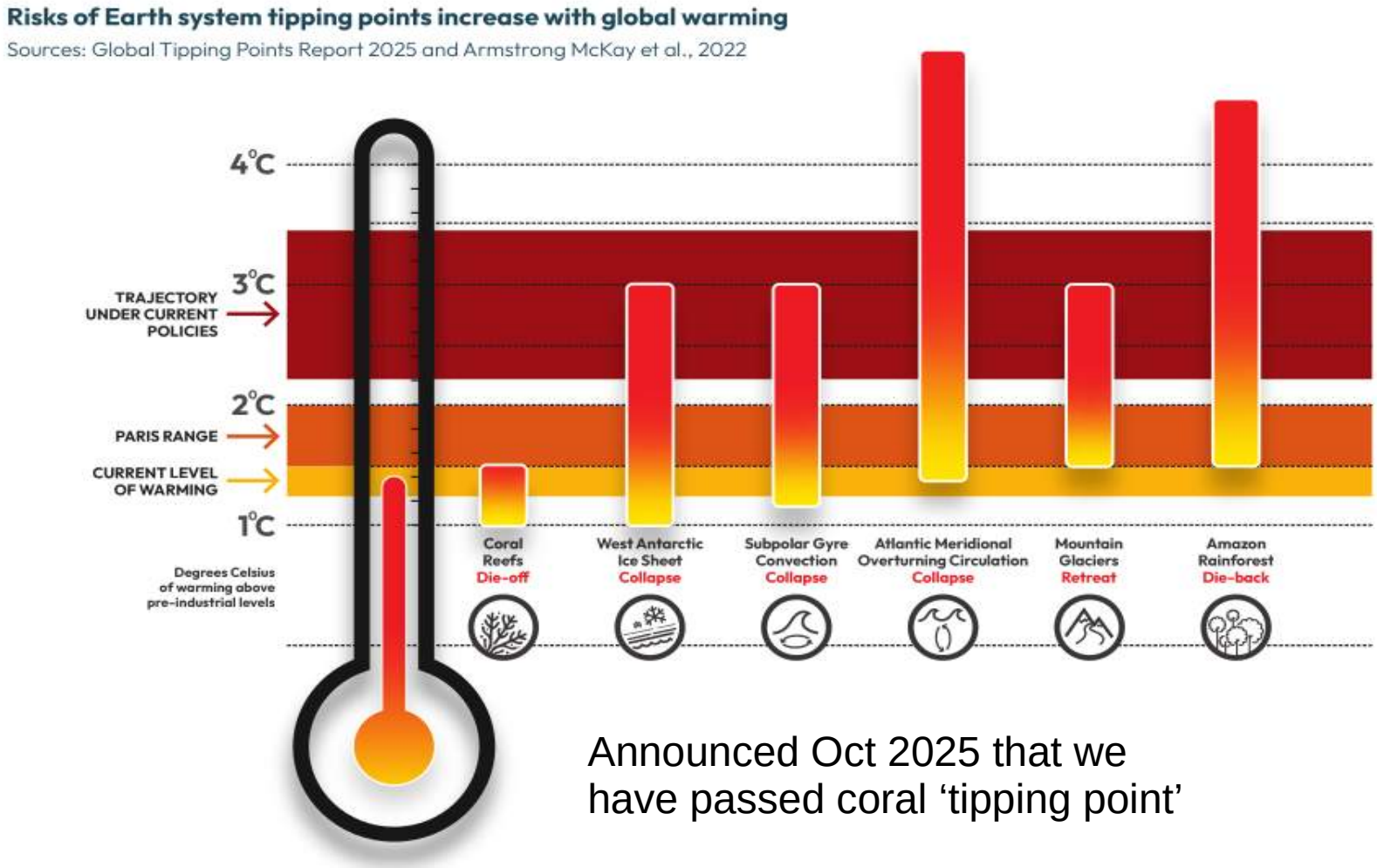
IPCC AR5: Species survival and rates of temperature increase

IPCC AR5 SYR SPM Figure 2.5 (a) The risks of disruption of the community composition of terrestrial and freshwater ecosystems due to the rate of warming



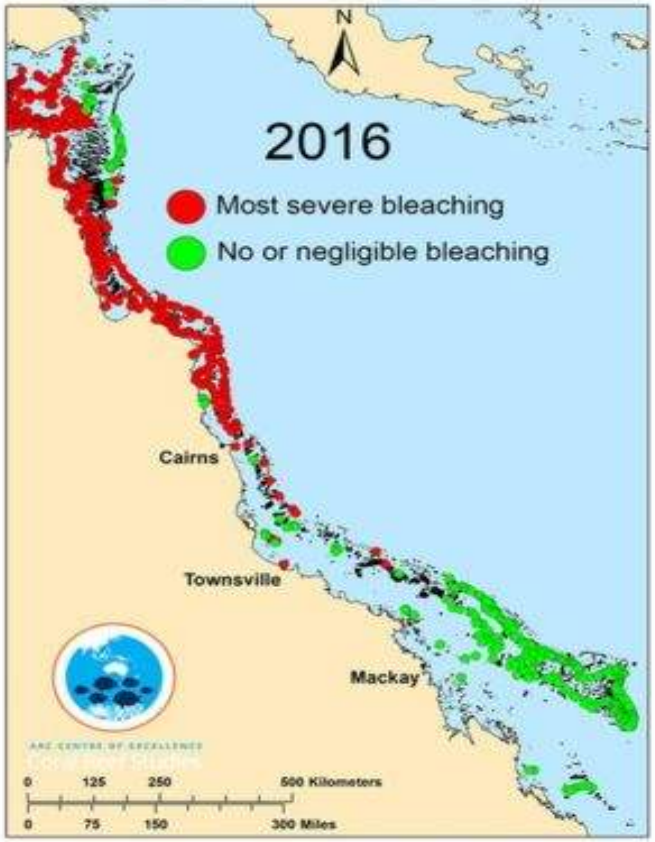
IPBES (Biodiversity) says climate change is currently **third** most important driver of biodiversity loss. But will become **top**.

What are the risks? Tipping points.



Announced Oct 2025 that we have passed coral ‘tipping point’

What are the risks? Ecosystems.



Areas of Great Barrier Reef coral untouched by severe bleaching and death in 2016 were hit the following year. 2025 has also been very severe.

An estimated 500m people depend on coral reefs.

What are the risks?

The scariest one of all?

The long read

This article is more than **2 months old**

‘A climate of unparalleled malevolence’: are we on our way to the sixth major mass extinction?

Churning quantities of carbon dioxide into the atmosphere at the rate we are going could lead the planet to another Great Dying

By Peter Brannen

Daniel Rothman works on the top floor of the building that houses the Massachusetts Institute of Technology (MIT) Department of Earth, Atmospheric and Planetary Sciences, a big concrete domino that overlooks the Charles River in Cambridge, Massachusetts. Rothman is a mathematician interested in the behaviour of complex systems, and in the Earth he has found a worthy subject.

Guardian, 19 Aug 2025

Extract of Peter Brannen, *The Story of CO_2 Is the Story of Everything*, Penguin

What are the risks?

The scariest one of all?

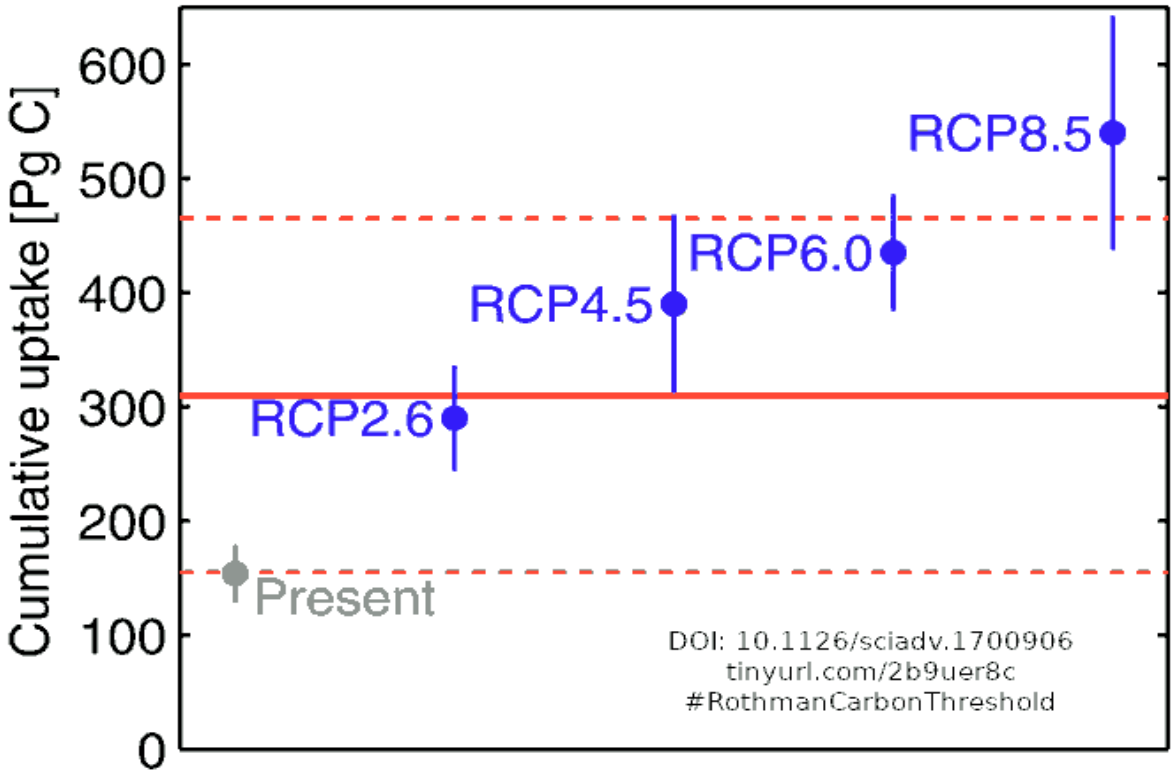


Fig. 4 Cumulative modern ocean uptake of carbon since 1850, up to the present (green) and projected to 2100 (blue), compared to the predicted critical mass of 310 Pg C (solid red line) and an assumed uncertainty of ±50% (dashed red lines).

We're adding CO_2 faster than Siberian volcanoes 252 million years ago ('the Great Dying').

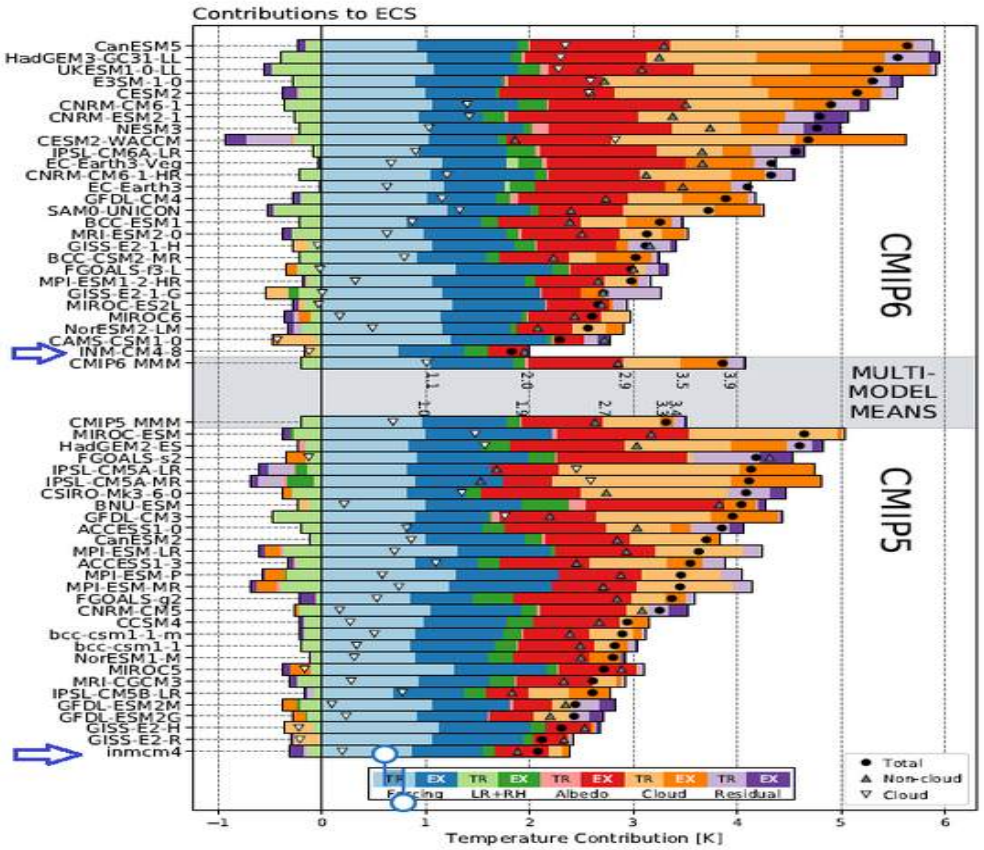
Where does Rothman suggest the extinction threshold is when this fast?

About 2 °C.

How fast do we need to cut emissions?

Temperature (°C)	Estimated remaining carbon budgets from the beginning of 2025 ($GtCO_2$)				
Avoidance probability:	17 %	33 %	50 %	67 %	83 %
1.5	320	200	130	80	30
1.6	620	420	310	240	160
1.7	910	640	490	390	290
2.0	1790	1310	1050	870	690

How fast do we need to cut emissions?

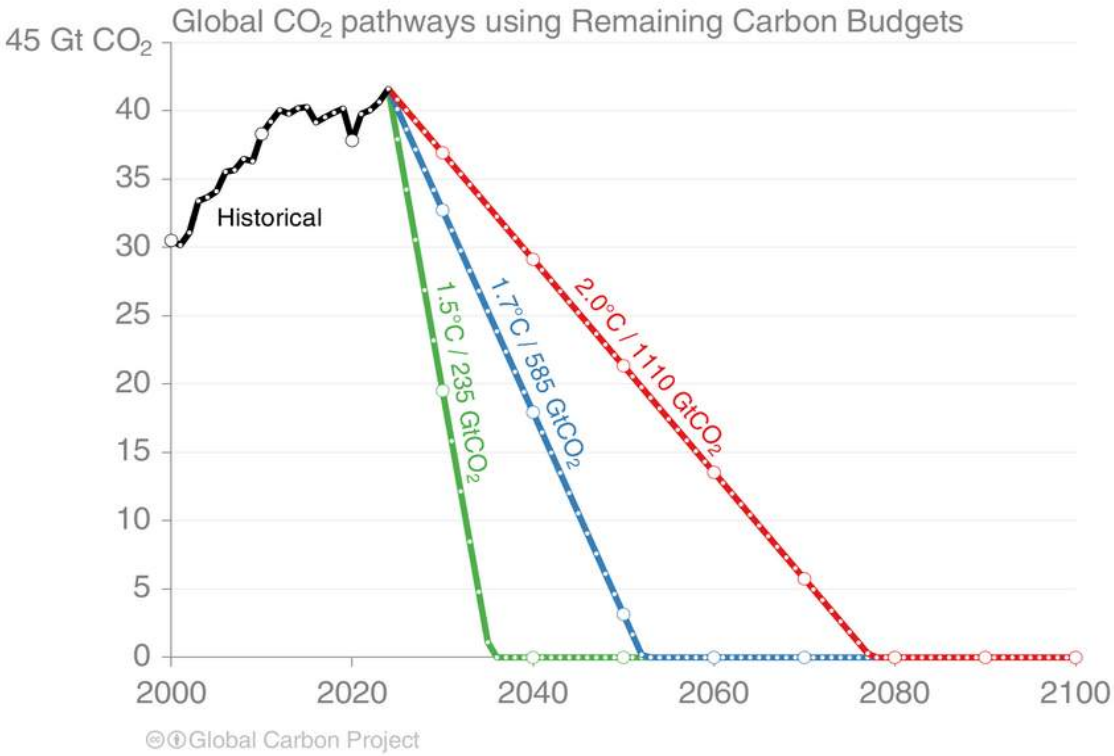


"uncertainty is not your friend"

A *doubling* of CO_2 could cause between 2.5 °C and 5 °C of warming. Typically assume 3 °C 'climate sensitivity'; James Hansen suggests 4.8 °C.

Biggest contributors to this 'climate sensitivity' range ('uncertainty') are effects of clouds and aerosols.

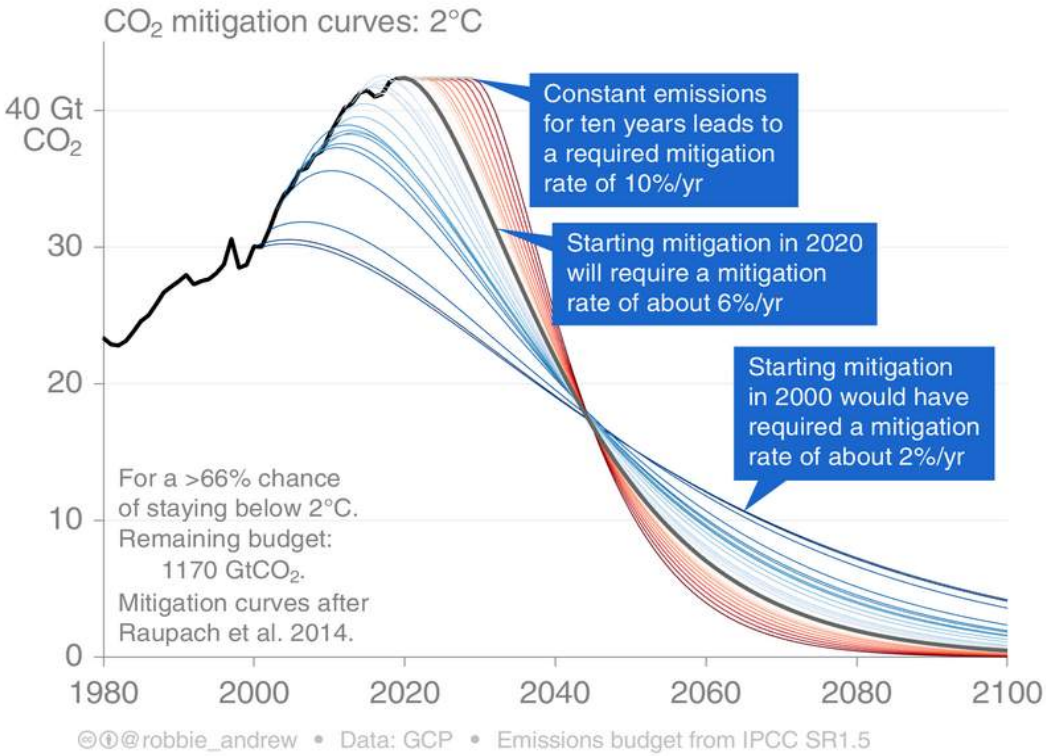
How fast do we need to cut emissions?



Harms and risks depend on ‘the area under the curve’. That is, final temperature is proportional to accumulated emissions.

When we reach (net) zero GHG emissions, some CO_2 continues to be taken up by ocean and land sinks, so primary global heating should stabilise. Sea-level rise will continue.

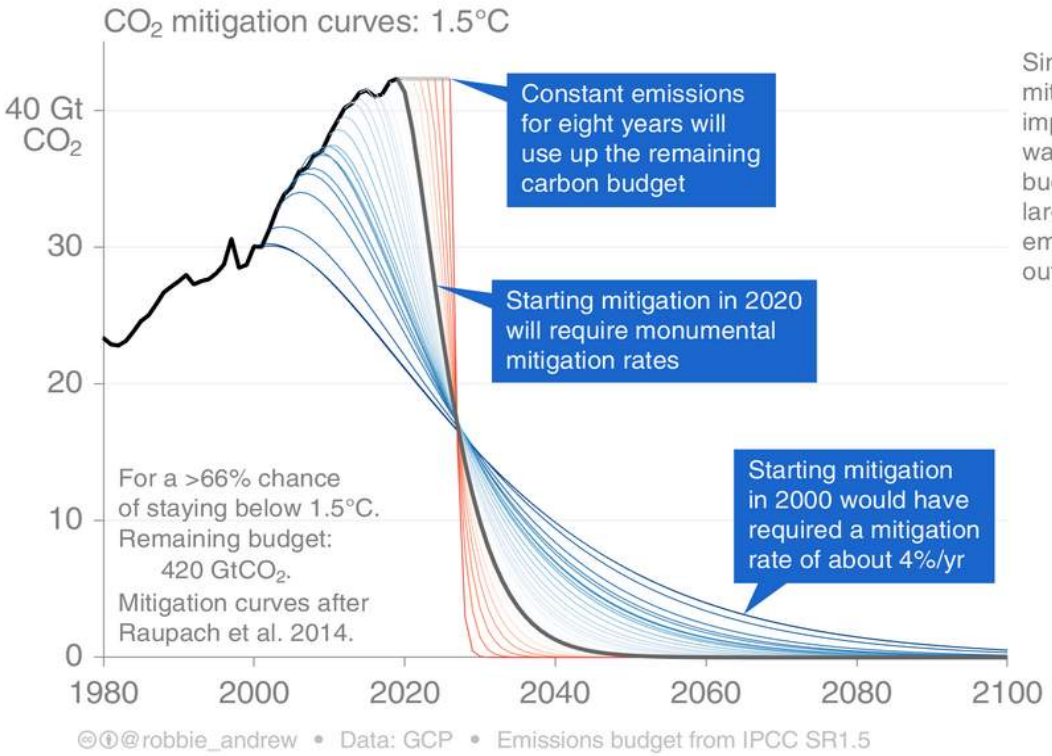
How fast do we need to cut emissions?



The later emissions peak, the sooner they need to stop altogether.

Chart from 2019, for 2 °C carbon budget.

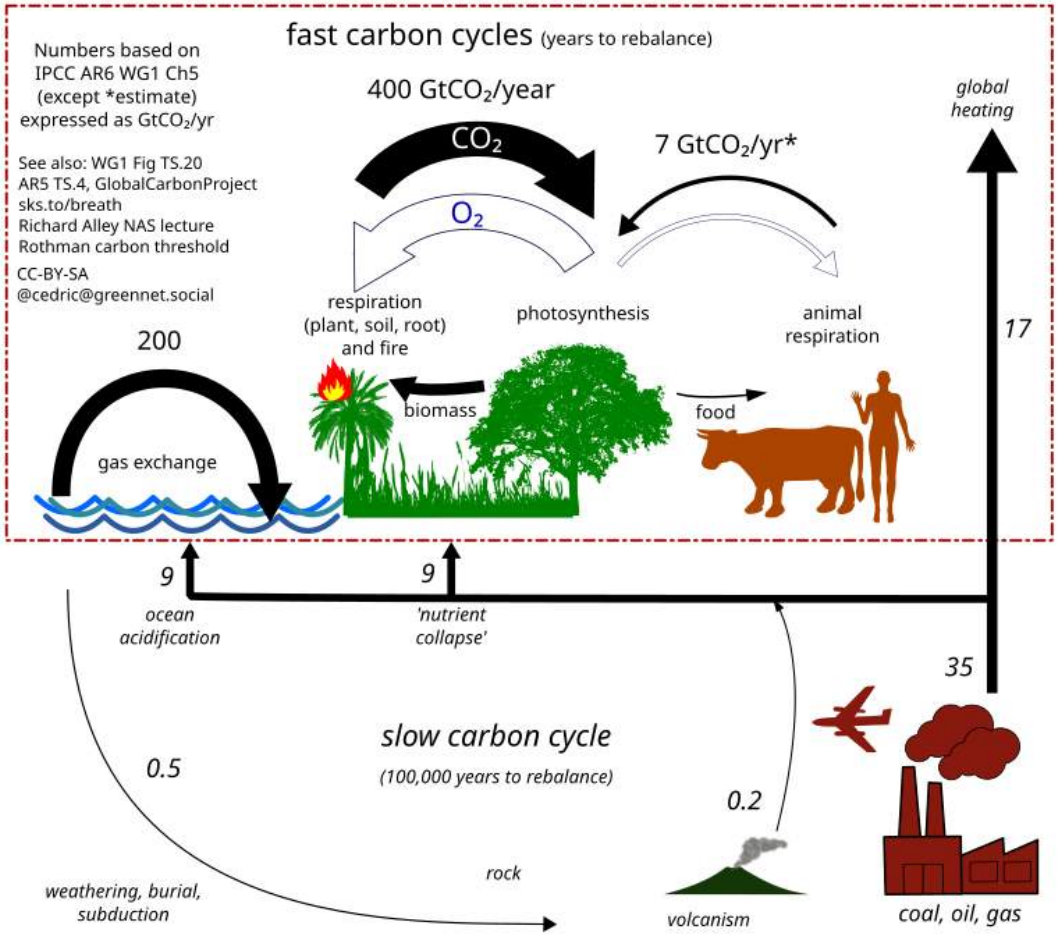
How fast do we need to cut emissions?



Since such steep mitigation is impossible, the only way to achieve this budget is with very large "negative" emissions: pulling CO_2 out of the atmosphere.

Paris (2015) target.
COP26: ‘keep 1.5 alive’.
Very likely by 2030.

What is important to cut?



Carbon split between air/sea/soil is elastic and dominated by (fast) natural processes.
Increase in air/sea/soil system is dominated by fossil fuel extraction.
Air and sea-surface CO_2 have already risen 50% since the Industrial Revolution.

Four carbon cycles.

The important driver is carbon entering and leaving rock, which it naturally does very slowly.

Deposition of inorganic carbon stops at Rothman threshold.

What is important to cut?

Questions?

How fast do we need to cut emissions?

Didn’t say there would be a test question, but here we go:

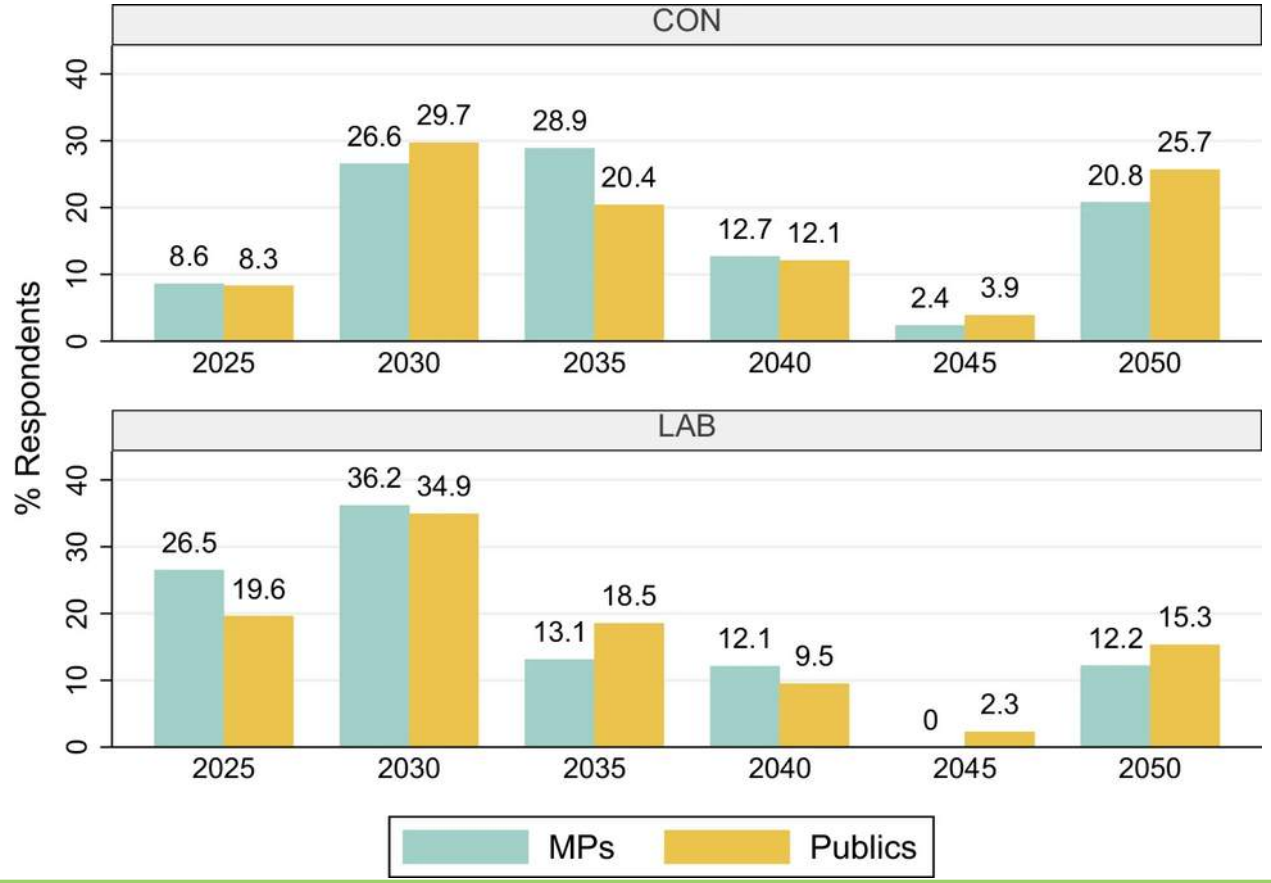
The 2022 IPCC report "provided a timescale by which global greenhouse gas **emissions must peak** to limit global heating to 1.5 [°C] ... **When** do you think this is?"

2025 | 2030 | 2035 | 2040 | 2045 | 2050

Based on this presentation so far, what would you say?

Kenny & Geese (2025)

What is most effective action (opinion)?



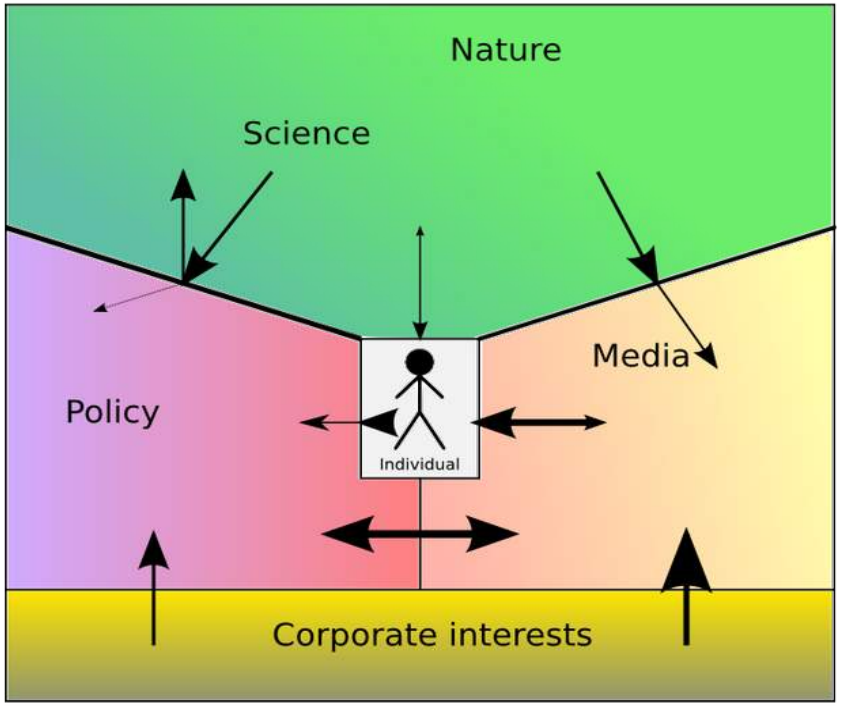
Most MPs know climate change exists, but know nothing about its urgency.

The 2022 IPCC report "provided a timescale by which global greenhouse gas **emissions must peak** to limit global heating to 1.5 ... **When** do you think this is?"

Kenny & Geese (2025) doi.org/10.1038/s43247-025-02655-w and *The Conversation* article.

Correlated with age and worry, but also newspapers? Do people understand emissions and concentrations are different?

What is most effective action (opinion)?



Flows of ecological information and pressure
The science-policy interface is like two media with different refractive indices.

React to and amplify science, engage elites?

National Emergency Briefing for MPs:
Thu 27 Nov
www.nebriefing.org

What is most effective action (opinion)?

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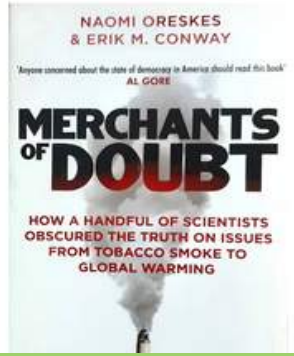
Big-picture books: Merchants of Doubt

Merchants of Doubt **by Naomi Oreskes & Erik M Conway.**
(and *The Burning Question* by Mike Berners-Lee and Duncan Clark.)

It's a political thriller and an eye-opening story of high-stakes skulduggery, and the villains are high-profile physicists – and it's all true.

Two books came to mind when thinking about what to do for our first monthly book review to sync with the WCA newsletter. I read the two back-to-back over ten years ago; both are highly readable and both have glowing front-cover reviews from Al Gore (alongside long explanatory subtitles); and both get to the nub of the climate problem, albeit in different ways. Together, they give a clear indication where climate-concerned people (maybe anyone who cares about anything) could most effectively concentrate efforts. One is



There is much lobbying for delay.

Read recent WCA blogs!

What is most effective action (opinion)?

2012, these are a 75% chance of avoiding 2 °C, a 565 Gigatons carbon budget, and a 'terrifying' 2,795 Gigatons, so we knew of five times more more coal, oil and gas in rock than we can extract.[1] We've not got a shortage of carbon 'resources' as previously sometimes thought, we've far too much.

> The three numbers I've described ... provide intellectual clarity about the greatest challenge humans have ever faced. We know how much we can burn, and we know who's planning to burn more. ... the more carefully you do the math, the more thoroughly you realize that this is, at bottom, a moral issue; we have met the enemy and they is Shell.

Sic. This last point apparently refers to Walt Kelly's poster and cartoon for the

Bill McKibben 'Global Warming's Terrifying New Math'

What is most effective action (opinion)?

- See Carbon Tracker – extracting all known economic fossil fuel reserves leads to 3 °C heating.
- Oil Change International – continuing all *current* extraction (no new infrastructure) leads to 1.7 °C heating. ≥60% infrastructure needs retiring for 1.5 °C.
- ‘Negative emissions’ (Carbon dioxide removal) – unlikely at scale.
- Hence, no new fossil fuel extraction

What is most effective action (opinion)?

situation/intervention	**effects**	**overall**
increasing oil price	incentivise extraction discourage use	— (little effect)
decreasing oil price	discourage extraction incentivise use	—
carbon fee and dividend (fair climate income)	discourage extraction discourage use	🙂 
more renewables alone	adds to energy consumption	— (little effect)
more efficiency alone	adds to use (Jevons paradox)	— (poss increase)

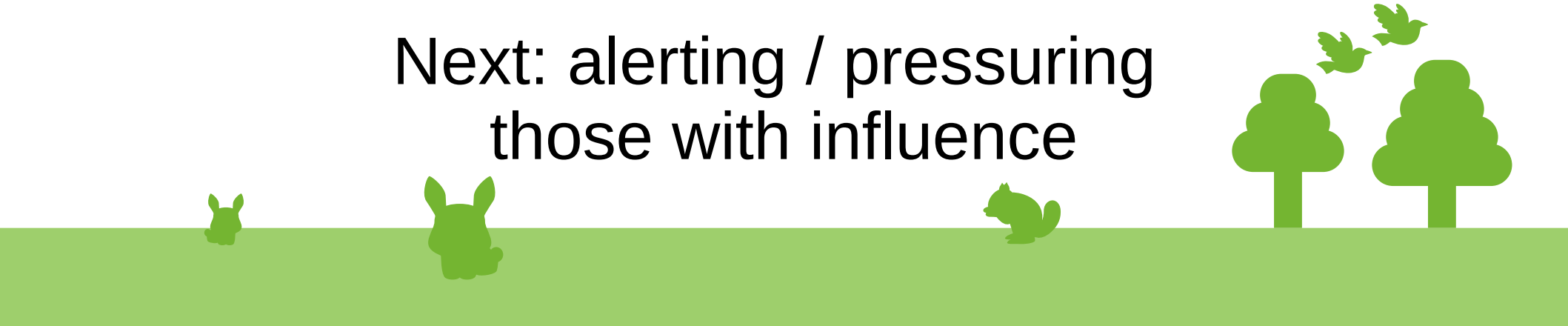
What is most effective action (opinion)?

situation/intervention	**effects**	**overall**
global emissions cap	alas sabotaged (UNFCCC COP30)	
global extraction cap (Fossil Fuel Treaty)	limit extraction encourage just transition	
local extraction limits	about 50% reduction in usage / emissions	
reducing fossil fuel social licence / lobbying etc	more rational policy-making	
what else?		

Questions?

Comments?

Next: alerting / pressuring those with influence



Campaigning / letter writing

- Want support for
  - Fossil Fuel Non-proliferation Treaty
  - Climate and Nature Bill
  - End to new extraction (Stop Rosebank, aligning finance)
  - Green jobs and green skills (good news today?)
  - Energy efficiency, heat pumps, earlier combustion phase out
- Oppose
  - New combustion sources, eg aviation expansion

Campaigning / letter writing

- Who has influence on what, and who can be swayed?
- Letter writing tips
  - Have one aim and one request (hard to do?)
  - Make it personal (but authoritative references help?)
  - Ask MPs to ask ministers, or ask PQ
  - what else?
- 💚